

# Maternal Perception of Body Weight of Children Attending Child Welfare Clinics in Secondary Hospitals in Ibadan Municipal, NIGERIA

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## ABSTRACT

Perception of the child's weight by mothers can determine feeding practices and if inaccurate, could be a potential risk factor for weight problems. This study was designed to examine maternal perception of child's weight and factors associated with such perception. A cross-sectional survey was used and 359 mother-child pairs were selected from child welfare clinics in Ibadan municipality. Mothers were asked what they thought about the weight of their children. The actual weight of children was measured and converted to z-scores using WHO Anthro 2011. Children were classified as normal (z-score: -2.0-2.0), underweight (z-score: <-2.0) and overweight/obese (z-score: >2.0). Data were analysed using descriptive statistics and Chi-square test at  $p=0.05$ . The mean age of mothers was  $31.6 \pm 5.0$  years, most (54.3%) had tertiary education and majority (86.4%) were gainfully employed. The mean age of children was  $18.0 \pm 9.3$  months and more than half (55.2%) were males. Of 359 mothers, 161(44.9%) perceived their children to be underweight, 188 (52.4%) normal weight and 10(2.8%) overweight. 66.0% misperceived their children's weight status; the overall percentages of misperception of the child's weight were 76.3% in underweight children, 61.7% in normal weight children but only 9.13% in overweight/obese children. Factors such as children's age, number of children, and self-perception of weight influenced mothers' perception of child's weight. A large proportion of mothers did not correctly perceive the weight of their children. Strategies to increase mothers' awareness of their children's weight could be the first key step in preventing childhood weight problems.

**Keywords:** Maternal perception, Body Weight, Verbal Weight Description

## INTRODUCTION

Child malnutrition is a global public health problem, especially in low and middle income countries, contributing to over 2.6million child deaths, a third of the total child deaths (1). One in four children worldwide is stunted. Africa and Asia have greater burdens of malnutrition. In Africa, 21% of the children are underweight and 40% wasted (2). Nigeria alone accounts for 11 million of these cases and is still projected to have about 1.6million additional stunted children by 2020 (3). The Nigerian National Demographic Health

Survey 2013 indicates that 37% of children under the age of five years were stunted, while 18% and 29% were wasted and underweight respectively. The effects of malnutrition, either over nutrition or under nutrition, have a great impact on child mortality (4). The achievement of optimal child nutrition and growth involves many factors but depends basically on adequate and appropriate nutrition largely influenced by feeding.

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Feeding of children in most homes depends strictly on the mother; the quality of food given, the quantity given and number of times fed daily all depends on the mothers. They create environments for children that either promote weight gain or loss (5). They therefore constitute an important influence of child development including health and weight. It is important for mothers or caregivers to be able to make a distinction between a normal weighted child and an abnormal one; this will ensure that adequate preventive and corrective measures are put in place (6). A mother's perception of the weight status of her child is important because it determines the feeding patterns and care which in turn affects the overall nutritional status of the child (7). Since feeding practices may be determined by the perception of the child's body weight, misperceptions can lead to an inappropriate feeding of a child, for example a mother may encourage a healthy-weight child to eat more/less or to gain/lose weight (8). Situations of misperception can thus be responsible for the persistence of high rate of childhood malnutrition in Nigeria despite various interventions that have been put in place.

Although limited in number, recent studies on maternal perception of children's body weight have focused on overweight, not underweight (9-12). Many of the studies were on older children and did not address the maternal perception of the child's weight until they had reached school age (9-12). This study examined both underweight and overweight and focused on children between the ages of 6 months and 36 months because it would be expected that children in this age range will be at equal or at least close to equal level of nutritional status, considering that breastfeeding was exclusively practiced. A

difference is usually seen thereafter which depicts the impact of individual mothers via efforts put into complementary feeding; This extra effort will depend not only on her education or socio-economic status as most studies have shown but on her ability to accurately perceive the appropriate weight of the child. This stage is also peculiar because after about 2 years, it becomes very difficult to reverse stunting that occurred at these early stages (13-15). Although the increasing number of studies on this topic signals a new appreciation for the role of maternal perceptions in the development and treatment of weight problems in children, there is a large gap in the literature and many unanswered questions about the relationship between maternal perceptions of child weight status and the actual weight status of children.

Against this background, the objective of this study was to assess mothers' perception of their child's body weight and measured this perception over several factors.

## METHODS

This cross-sectional study was carried out in secondary hospitals with child welfare clinics in Ibadan municipal, Oyo State. A sample size of 359 mother-child pairs was calculated using the formula for estimating sample size for one-sample comparison of proportion at 95% level of confidence and assuming 10% of the study for the estimate of non-response. Participants were recruited as they presented to the clinic until the sample size was reached. All Mother-child pair within the age range 6-36 months present at the clinic that were willing and gave consent to participate in the study were included till the sample size was met. Written consent was obtained from mothers before data collection.

Table 1: Characteristics of the children

Characteristics of children	n (%) 359 (100.0%)
Sex	
Male	198(55.2)
Female	161(44.8)
Age (in months)	
<12	127(35.4)
12-24	122(34.0)
>24	110(30.6)
Characteristics of mothers	n(%) N=359
Marital Status	
Married	335(93.3)
Never married	18(5.0)
Separated/Divorced	6(1.7)
Age (in years)	
19-28	88(24.5)
29-38	244(68.0)
>38	27(7.5)
Level of Education	
No formal education	15(4.2)
Primary	24(6.7)
Secondary	125(34.8)
Tertiary	195(54.3)
Employment Status	
Employed	310(86.4)
Unemployed	49(13.6)
Ethnic group	
Hausa	5(1.4)
Igbo	59(16.4)
Yoruba	294(81.9)
Others	1(0.3)

Table 2: Mothers' perception of child's weight by actual weight status

Actual weight status	Perceived weight			Total N=359	X <sup>2</sup>	P-value
	Underweight n=161(%)	Normal-weight n=188(%)	Overweight n=10(%)			
Underweight	15(25.4)	43(72.9)	1(1.7)	59	44.356	0.000
Normal-weight	146(52.7)	125(45.1)	6(2.2)	277		
Overweight	0(0.0)	20(87.0)	3(13.0)	23		

Table 3: Association of Mothers' perception of weight status with maternal and child characteristics

Characteristics	Maternal Perception			Total	X <sup>2</sup>	P-value
	Underweight n=161(%)	Normal weight n=188(%)	Overweight n=10(%)	N=359		
<b>Sex of child</b>						
Male	92(46.5)	99(50.0)	7(3.5)	198	1.621	0.445
Female	69(42.9)	89(55.3)	3(1.9)	161		
<b>Age of child</b>						
<12	48(37.8)	76(59.8)	3(2.4)	127	11.032	0.026*
12-24	66(54.1)	55(45.1)	1(0.8)	122		
>24	47(42.7)	57(51.8)	6(5.5)	110		
<b>Mother's level of education</b>						
None	4(57.1)	3(42.9)	0(0.0)	7	14.069	0.029*
Primary	7(46.7)	8(53.3)	0(0.0)	15		
Secondary	65(55.1)	47(38.8)	6(5.1)	118		
Tertiary	85(38.8)	130(59.4)	4(1.8)	219		
<b>Exclusive breastfeeding status</b>						
No	54(42.5)	71(55.9)	2(1.6)	127	1.741	0.419
Yes	107(46.1)	117(50.4)	8(3.4)	232		
<b>Ethnicity</b>						
Hausa	2(40.0)	3(60.0)	0(0.0)	5	7.011	0.393
Igbo	33(55.9)	25(42.4)	1(1.7)	59		
Yoruba	125(42.5)	160(54.4)	9(3.1)	294		
Others	1(100.0)	0(0.0)	0(0.0)	1		
<b>Mother's Self-perception of weight</b>						
Underweight	30(71.4)	11(26.2)	1(2.4)	42	20.855	0.000*
Appropriate	65(35.3)	112(60.9)	7(3.8)	184		
Overweight	66(49.6)	65(48.9)	2(1.5)	133		

Table 4: Logistic regression analysis of factors associated with accuracy of perception of child's weight

Characteristics	Odds ratio	P-value	95% CI
<b>Child's actual weight</b>			
Normal weight*			
Underweight	2.12	0.042	1.20 – 6.75
Overweight	3.02	0.034	2.05 - 4.46
<b>Presence of caregivers</b>			
Yes*			
No	0.81	0.817	1.40 - 4.70
<b>Mother's self-perception of weight</b>			
Accurate*			
Inaccurate	1.65	0.078	0.39 – 1.19

The weight of children was measured to the nearest 0.1kg using a validated calibrated weighing scale. Child's weight was taken by putting the child on the weighing scale without clothes or shoes on. All measurements were taken twice and then the average was recorded. A pre-tested interviewer-administered questionnaire was used to elicit information from the mothers on socio-demographic factors, weight assessment information and perception of mothers on the weight of their children. Perception was measured by asking the mother, what she thought about the weight of her child. The options were: underweight, slightly underweight, about the right weight, overweight, or obese. These were collapsed into three categories for analysis: underweight, normal weight and overweight. Instrument was translated to Yoruba (native language of the people in the study area) and back translated to English to ensure consistency in information.

Data were analysed using SPSS 20.0. The Weight-for-age z score (WAZ) was calculated using 2011 WHO Anthro software (WHO Anthro for personal computers, version 3.2.2., 2011) to enable comparison with WHO standards for children within 0-60months. The WAZ scores for each child was imported into SPSS and categorised as underweight, normal weight or overweight. Data was then summarized with descriptive statistics and presented using frequency tables and charts. Accuracy of perception was assessed by comparing mother's perceived weight with the child's actual weight. This was then coded as 0 for Inaccurate and 1 for Accurate. The rate at which parents wrongly classified their children's weight status was calculated and presented with percentages. Logistic regression analysis was done to determine the factors that affect accuracy of mother's perception of child's weight.

Ethical approval was obtained from the Oyo State, Nigeria Ethical Review Board. Informed consent was obtained and voluntariness,

confidentiality, beneficence and non-maleficence were ensured.

## RESULT

### Sample Characteristics

Three hundred and fifty nine (359) pairs of mother and child participated in the study, all 359 responses were valid. More than half (55.2%) of the children were males and the mean age was  $18.0 \pm 9.3$  months. The characteristics of the children that participated are shown in Table 1. The age of the Mothers in this study ranged from 19 to 50 years with a mean age of  $31.6 \pm 5.0$  years. Majorities (93.3%) of the mothers are married and 81.9% are Yoruba. About 54.3% of the mothers had tertiary education, 86.4% are gainfully employed out of which 30.9% are traders/business woman.

### Mothers' perception of child's weight

When asked to verbally describe the weight of the child 188(52.4%) said their child was at a normal weight, 161(44.8%) said their child was underweight and 10(2.8%) said their child was overweight. (Table 2)

Table 3 shows the perception of mothers against certain maternal and child characteristics. More of the males (46.5%) were perceived to be underweight compared to the females (42.9%) and 7(3.5%) of the males were perceived to be overweight. Children less than 12 months of age were least perceived to be underweight (37.8%) and most perceived to be normal weight (59.8%) while children within the age range 12-24 months were least perceived to be overweight (0.8%). About 130(59.4%) of the mothers with tertiary education perceived their children to be normal weight and 4(1.8%) perceived their children to be overweight while none of the mothers with at most primary education

perceived their children to be overweight. Out of the five Hausa mothers that participated in the study, 2(40.0%) described their children as underweight while none described their children as overweight. One hundred and twenty five (42.5%) of the Yoruba mothers described their children as underweight while 160(54.4%) described their children as normal weight. About 35.3% of the mothers that perceived their own weight to be normal described their children as underweight while most (71.4%) of those that perceived their own weight as underweight also described their children underweight.

About 107(46.1%) of children that were exclusively breastfed were described by their mothers as underweight and 8(3.4%) as overweight while 54(42.5%) of those that were not exclusively breastfed were described as underweight and 2(1.6%) were described as overweight. Characteristics that were statistically significant on the bivariate analysis were: child's actual weight, presence of caregivers and mother's self-perception of weight. These factors were entered into the logistic regression model to further explore the strength of the association (Table 4). Child's actual weight and mother's self-perception of weight remained significant factors associated with accuracy of perception of weight. Mothers of overweight children were about three times more likely to inaccurately perceive the weight of their children than the mothers of normal weight children (OR = 3.02; 95% CI: 2.05-4.46) while mothers of underweight children were two times more likely to inaccurately perceive the weight of their children than mothers of normal weight children (OR = 2.12; 95% CI: 1.40-4.70). Mothers that do not have other caregivers have reduced odds of inaccurately



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perceiving the weight of their children (OR = 0.81; 95% CI: 1.40-4.70)

## DISCUSSION

The present study shows that a sample of Nigerian mothers did not accurately perceive their children's weight. A significantly high misperception of child's weight was shown among both mothers of overweight as well as underweight children. A significant number of mothers verbally misclassified their children's weight either by underestimating overweight or obese children, or by overestimating normal weight children. The proportion of misperception was highest among mothers of overweight/obese children who underestimated their children's weight, supporting the finding from United Arab Emirates (1, 15). Similarly, high proportions were found in previous studies, with 72 - 90% of the mothers underestimating the weight status of their overweight child (14, 16, 17).

Several potential causes may underlie such inaccurate maternal perception of the child's weight. First, mothers may detect overweight or underweight in their children until it is very extreme either because they just do not recognize it or are not enhanced with the skills to recognize it. Also mothers may feel reluctant to admit that their child has a weight problem (18). Arguably, some of the mothers may have deliberately opted to underestimate the weight status of their children because they would not want to use the word 'overweight' for their children to avoid stigmatization as there was no more desirable and simpler term to describe overweight or obese to make the mothers feel comfortable with agreeing to the term.

Almost an equal proportion of the males and females were accurately perceived but the males were more inaccurately perceived to be underweight compared to the females, indicating that mothers are more likely to underestimate even the normal weight of their sons as compared with their daughters. This finding may reflect actual differences in the expected body weight for boys and girls, it is more likely that this tendency shows what constitutes "ideal" body weight for both boys and girls. In comparison with the "thin ideal" female body, a normal-weight girl would likely be perceived as normal or even slightly overweight while a male that is of normal weight will be considered underweight (19).

However, in comparison with the expectation that boys, as they grow older should be big, strong, and muscular, normal-weight boys may be perceived as too small. Rather, boys perceived as underweight may be encouraged to overeat, as larger boys are considered to have a physical advantage over those who are smaller, placing these children at risk for future overweight (19).

Older children (> 24months) were more perceived to be underweight than younger children (less than 12months). Maynard et al, 2003 supported this finding that mothers are less likely to misclassify older children as overweight as compared with younger children. In younger children, mothers tend to believe that their child will outgrow being overweight overtime once the child becomes older, taller, and more active. This may be because at this age the children are already involved in play activities that the mothers believe makes the child lose weight (20).

Factors associated with accurate weight perception, in both overweight and

underweight weight children, were the children's actual weight and the mother's self-perception of her weight (both characteristics found to be significantly associated with accurate weight perception). No significant association was found between other demographic characteristics and accurate weight perception, which is not in keeping with what other studies have reported (10, 16, and 21). This difference in results may be due to differences in general characteristics of the study populations of previous studies and this study. However, though not significant on statistical analysis, is worthy of note that in line with previous studies (10, 16, 21) it was found that mothers with low educational level were more likely to underestimate their child's weight as none of them perceived their child's weight as overweight.

## CONCLUSION

This study shows that:

1. A relatively large proportion of the mothers misperceive their child's weight, especially mothers of children with a deviant in their weight (underweight or overweight)
2. The associated factors of accurate maternal weight perception are the children's actual weight status and mother's self-perception of her weight.

Thus, despite increasing the global awareness of the rates of childhood weight problems and malnutrition in general, many mothers remain unable to recognize when their own children are at risk. Therefore, there is the need to correct these weight misperceptions and health professionals need to assist mothers to correctly perceive their child's weight. Strategies such as the use of growth charts and sensitively addressing cultural beliefs around children's weight should be considered.

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## LIMITATIONS OF THE STUDY

Due to the cross-sectional nature of the study, it is not possible to establish causation between the independent variables and the mother's perception of child's weight.

## DECLARATIONS:

- Ethics approval and consent to participate: Approval was obtained from the Oyo State Ethics Review Committee and written informed consent was obtained from the participants.
- Consent for publication: All authors consented to the publication of this manuscript.
- Availability of data and material: The dataset is available on request.
- Competing interests: The authors declare that there are no conflicts of interests.
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Meta-analysis.

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